

WE CLAIM:

1 1. An enclosure for an optical communications device that joins with a connector
2 of an optical cable, the enclosure comprising:

3 a base portion;

4 a lid portion having focusing elements and affixed to the base portion, wherein the lid
5 portion and the base portion are adapted to receive at least a portion of the optical
6 communications device therebetween; and

7 at least one alignment member formed on the lid portion, the alignment member
8 adapted to interface with the connector to align the connector relative to lid portion.

1 2. The enclosure of claim 1 wherein the lid portion is recessed to receive at least
2 a portion of the optical communications device therebetween.

1 3. The enclosure of claim 1 wherein the at least one alignment member is metal
2 deposited into the shape of the at least one alignment member.

1 4. The enclosure of claim 3 further comprising a preliminary layer on the lid
2 portion to promote adhesion of the deposited metal.

1 5. The enclosure of claim 1 wherein the at least one alignment member is a
2 prefabricated alignment member bonded to the lid portion.

1 6. The enclosure of claim 5 further comprising a preliminary metal layer on the
2 lid portion, and wherein the prefabricated alignment member comprises metal welded to the
3 preliminary metal layer.

1 7. The enclosure of claim 1 wherein the at least one alignment member is shaped
2 from the lid portion.

1 8. The enclosure of claim 1 wherein the at least one alignment member is a
2 microsphere.

1 9. The enclosure of claim 1 wherein the lid portion further comprises at least one
2 recess which receives the at least one alignment member.

1 10. The enclosure of claim 1 wherein at least a portion of the lid portion is
2 transparent and the focusing element is formed into the lid portion.

1 11. The enclosure of claim 1 wherein the at least one alignment member has a
2 flared base portion.

1 12. The enclosure of claim 1 wherein the at least one alignment member is formed
2 on an overlay, and the overlay is affixed to the lid portion.

1 13. A method of fabricating an optical interconnect device, the optical
2 interconnect device including optical-electrical components for interfacing an optical and an
3 electrical signal, comprising:

4 forming at least two alignment members on a substrate;

5 affixing the substrate to a base material with at least a portion of the optical-electrical
6 components therebetween; and

7 segmenting the affixed substrate and base material into at least two portions of affixed
8 substrate and base material, each portion having at least one alignment member.

1 14. The method of claim 13 wherein forming at least two alignment members
2 comprises depositing material in the shape of at least two alignment members.

1 15. The method of claim 14 further comprising using a mold to shape the
2 deposited material.

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1 16. The method of claim 14 wherein the material is a metal deposited in a
2 chemical vapor deposition process.

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1 17. The method of claim 14 wherein the material is a curable material that bonds
2 with the substrate as it hardens.

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1 18. The method of claim 14 further comprising the step of depositing a
2 preliminary layer on the substrate to promote adhesion of the at least two alignment
3 members.

1 19. The method of claim 13 wherein forming at least two alignment members
2 comprises molding the at least two alignment members together with the substrate.

1 20. The method of claim 13 wherein forming the at least two alignment members
2 comprises machining the substrate to form the at least two alignment members.

21. The method of claim 13 where forming the at least two alignment members comprises etching the substrate using photolithography techniques to form the at least two alignment members.

22. The method of claim 14 wherein forming the at least two alignment members on the substrate comprises affixing at least two prefabricated alignment members to the substrate.

23. The method of claim 14 wherein forming the at least two alignment members on the substrate comprises affixing an overlay having at least two alignment members thereon to the substrate.

24. The method of claim 14 further comprising etching the substrate using photolithography techniques to form at least one recess; and wherein the step of depositing material in the shape of at least two alignment members further comprises depositing material into the at least one recess in the shape of at least one of the at least two alignment members.

25. A structure divisible into two or more optical communication devices, each optical communications device having at least one optical electrical device, and each optical communications device adapted to join with a connector of an optical cable, the structure comprising:

a first substrate having at least two optical electrical devices thereon;
a second substrate affixed to the first substrate with the at least two optical electrical devices positioned therebetween; and

8 at least two alignment members formed on the second substrate and each
9 alignment member adapted to interface with the connector to align the connector in relation
10 to the second substrate.

1 26. The structure of claim 25 wherein at least one of the at least two alignment
2 members is a prefabricated alignment member bonded to the second substrate.

1 27. The structure of claim 25 wherein at least one of the at least two alignment
2 members is shaped from the second substrate.

1 28. The structure of claim 26 wherein at least one of the at least two alignment
2 members is a microsphere.

1 29. The structure of claim 25 further comprising at least two optical components
2 on the second substrate.

1 30. The structure of claim 26 wherein at least one of the at least two alignment
2 members is formed on an overlay and affixed to the second substrate.

1 31. The structure of claim 25 wherein at least a portion of the second substrate is
2 transparent and the second substrate further comprises at least two optical devices formed in
3 the second substrate.

1 32. An electro-optical interconnect device for coupling to a parallel fiber-optic
2 cable:
3 an electro-optical transducer;

4 a base including an integrated circuit electrically connected to said electro-optical
5 transducer; and

6 a lid including an array of optical elements optically coupled to said electro-optical
7 transducer, said lid assembly including at least one pin for engaging said cable, said lid
8 assembly and said base assembly collectively enclosing said electro-optical transducer.

1 33. A device as recited in claim 32 wherein said electro-optical transducer is
2 disposed between said integrated circuit and said array of optical elements.

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